

**Papahānaumokuākea Marine National Monument**  
RESEARCH Permit Application

***NOTE: This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).***

**ADDITIONAL IMPORTANT INFORMATION:**

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

**INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED**

Send Permit Applications to:  
NOAA/Inouye Regional Center  
NOS/ONMS/PMNM/Attn: Permit Coordinator  
1845 Wasp Blvd, Building 176  
Honolulu, HI 96818  
nwhipermit@noaa.gov  
PHONE: (808) 725-5800      FAX: (808) 455-3093

**SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.**

## Papahānaumokuākea Marine National Monument Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

### Summary Information

**Applicant Name:** Andrea Kimiko Kealoha  
**Affiliation:** University of Hawaii Maui College

**Permit Category:** Research  
**Proposed Activity Dates:** June 1, 2022 – Dec 31, 2026  
**Proposed Method of Entry (Vessel/Plane):** Plane  
**Proposed Locations:** Kuaihelani (Midway)

**Estimated number of individuals (including Applicant) to be covered under this permit:** 13 individuals

**Estimated number of days in the Monument:** Anticipate 17 days in July 2022, but up to 30 days. For future years anticipate 14-30, but up to 60 days

**Description of proposed activities:** (complete these sentences):

a.) The proposed activity would...  
examine the ecological effects of the invasive *Chondria (iC)* outbreak and the role of *Chondria* in the coral reef food web, which will lead to a greater understanding of the distribution, spread and ecological impacts of this nuisance alga. This project combines hydrographic data with isotopic analysis (stable and amino-acid compound specific isotope analysis (AA-CSIA)) of coral tissues to understand oceanographic, biogeochemical and ecological processes that may influence the presence, growth and distribution of iC at Kuaihelani and throughout the Northwestern Hawaiian Island archipelago.

b.) To accomplish this activity, we would ....  
conduct handheld CTD (conductivity, temperature, depth) casts in the forereef, backreef and lagoon of Kuaihelani. CTDs allow for depth profiles of both temperature and salinity to provide information about oceanographic processes (e.g., upwelling) below the surface ocean. Casts will be planned at defined locations and spatial intervals depending on allotted time for water sampling. Discrete water samples will be collected using a Niskin bottle deployed at various depth such as 1 m, 5 m and 10 m. In 2022, water sample analyses will include dissolved

inorganic nutrients (150 samples), particulate organic matter (POM) (25 samples) and Chl *a* (100 samples). 100 coral tissue samples for stable isotope and AA-CSIA analysis will be collected at shallow, consistent depths within and around Kuaihelani, and in areas of both high and low iC cover. Isotope analyses will also be performed on several samples of plankton (25 samples) and alga (see H. Spalding permit).

These methods and sample parameters collected will apply to 2022-2026, and may also include the collection of carbonate chemistry samples (not to exceed 150). The total number of samples collected for each parameter will remain the same in each subsequent year.

c.) This activity would help the Monument by ...  
providing insight into the environmental drivers of the iC outbreak that has occurred at Manawai and may occur at Kuaihelani and other locations throughout the monument. For example, CTD casts will generate temperature and salinity profiles that may help to identify locations for upwelling, and subsequently, nutrient hotspots. Similarly, water samples for nutrients, carbonate chemistry and Chl *a* will provide information on biogeochemical conditions that fuel iC presence, growth and distribution. Stable isotopes and AA-CSIA are useful in providing information about nutrient sources and cycling, food web interactions, and other ecological processes. Combined, these data will 1) provide valuable insight into the environmental processes that influence the presence, growth and distribution of *Chondria* at Kuaihelani, and 2) provide recommendations for targeted management and monitoring locations. A multi-year permit is required for several reasons. First, *Chondria* is a newly discovered species and we still have much to learn about this alga's ecological characteristics and behavior in the natural environment. Second, multi-year sampling will provide a more comprehensive understanding of transient versus permanent oceanographic and biogeochemical features at Kuaihelani that drive *Chondria* growth. Finally, *Chondria* will likely persist at Kuaihelani and throughout the monument, and tracking this alga's behavior over time will be critical for informing long-term management of the ecosystem.

**Other information or background:**